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by valid logic. So long as there remain uninterpreted relations in society, finical objections to the verbal or symbolic forms in which approximate interpretations are recorded for further examination should be regarded as the off-duty amusement of scholars, and treated as playfully as I have felt bound to deal with portions of the subject matter of Professor Patten's note. Sociology is not biology. Sociology is not a transcription of biological results. Sociology, however, must not only take into account vital facts, it must get all the help possible from vital analogies, or partial analogies, or from contrasts with vital facts. With this understanding it ought to be easy to transfer the debate from truisms to uncertainties. Professor Patten alludes in his note to a score of problems which are well worthy of attention, to the solution of some of which he will undoubtedly make important contributions. That end will not be promoted, however, by needless complication of essential difficulties with misconceptions of obvious and meaning truths. Whatever room there may be for differences of opinion about the metaphysics of human desire, or about the processes of human satisfaction, or about the division of labor among these problems, or about the most appropriate language with which to conduct investigations and report results, attack upon "the organic concept" is an entirely mistaken policy, and we owe it to ourselves to abandon it in favor of more profitable pursuits.

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SOCIOLOGY AND THE ABSTRACT SCIENCES. THE ORIGIN OF THE
SOCIAL FEELINGS.

Professor Patten's communication on "The Relation of Economics to Sociology," in the ANNALS for January, narrows the main issue between his views and mine to a mere question of what my conception of sociology is and what it is not. He says :

"At any rate, they (the sociologists) must choose between making their science a hypothetical science, dealing with the theory of social forces, and a realistic science dealing with the aggregate phenomena of the social world. Professor Giddings does not recognize this distinction. He defines sociology as an 'attempt to account for the origin, growth, structure and activities of human society by the operation of physical, vital, and psychical causes, working together in a process of evolution.' Here he evidently has in mind a concrete realistic science treating of all the phenomena of human society. On page 18, however, he says that 'sociology may be defined as the science of social elements and first principles.' Here I understand him to refer to the hypothetical science dealing with the social forces."

I can only say that Professor Patten has mistaken my meaning, and that I have never thought of sociology as the abstract or hypothetical science of social forces. Sociology is a concrete science, primarily descriptive and historical, secondarily explanatory. The abstract science of social forces, as Dr. Patten describes them, is not sociology but ethics. When I have defined sociology as the science of social elements and first principles, I have always been speaking of elements and first principles in the phenomenal or concrete sense, not in the sense in which such terms are used in an abstract science. These two kinds of elements and first principles, namely, the concrete and the abstract, are different categories. For example, cohesion and gravitation are elementary phenomena of the concrete physical universe; the laws of chemical combination and of the variation of gravitation with mass and distance, are first principles of concrete physical knowledge. But they are not, by any means, the elements and first principles of the abstract science of physics, which hypothetically goes back of all concrete phenomena whatsoever, and posits such pure abstractions as atoms, centrodcs, forces, tensions, motions and laws of motion.

When, consistently with this conception of sociology as a science of social elements and first principles in the concrete, I have called it the "fundamental" social science, I have had in mind its relation to those particular social sciences that are themselves concrete, such as concrete political economy, rather than its relation to any abstract science, such as the pure economics of Dr. Patten's conception. Nevertheless, I have contended in the "Theory of Sociology" that some social phenomena are evolutionally antecedent to most of the phenomena with which a pure economics can concern itself, and this position I have defended, against Dr. Patten's criticism, in my communication in the *ANNALS* for November, 1894. At the same time I have shown that the theories of subjective utility must be presupposed and appealed to in our explanation of the later and more complicated phenomena of a developed society.

This is equivalent to making one part of sociology antecedent to an abstract theory upon which a second part is consequent. Such a scheme would be fatal to the unity of sociology if we accepted a linear or serial classification of the sciences, like Comte's or Spencer's. But it is perfectly consistent with that arrangement of the concrete and the abstract sciences in two distinct series, one perpendicular to the other, which I presented in a paper on "The Relation of Sociology to Other Scientific Studies," published in *The Journal of Social Science* of November, 1894, and explained again in the discussion of sociology and economics at the meeting of the American Economic

Association at New York in December. Arranging the concrete sciences in order along the line Oy and the abstract sciences along the line Ox , perpendicular to Oy , we get their true relations as follows :

	Mathematics	Physics	Economics	Ethics
O				
x				
Chemistry				
Astronomy				
Geology				
Biology	p		q	t
Psychology	s		s'	u'
Sociology	v		v'	w
y				

The concrete or y sciences are descriptive, historical, inductive. The abstract or x sciences are hypothetical and deductive. The concrete become explanatory only because they are traversed or crossed by the abstract sciences ; that is to say, in so far as they get beyond mere description and history they do so by appealing to the hypothetical principles of the "pure" or deductive sciences. On the

other hand, the abstract sciences are not abstractions from nothing. They are abstractions from concrete phenomena. That is to say, they presuppose and take for granted the descriptive and historical matter of the concrete sciences.

Accordingly, the field of the physical sciences is $O p q r$. On their descriptive side they are known as chemistry, astronomy, geology and biology, according to their concrete subject-matter. On their explanatory side all are mathematical and physical. The fields of psychology and sociology are $p s u t$ and $s v w u$. On their descriptive side they presuppose the concrete physical sciences. On their explanatory side they are mathematical, physical, economical and ethical; every one of the abstract sciences contributes principles of interpretation to concrete psychology and to concrete sociology.

Historically, too, the concrete sciences are older than the abstract. The abstract have been derived from the concrete. $O x$ has rotated from $O y$. Thus, mathematics and physics have been derived by abstraction from the concrete natural sciences. Pure economics and abstract ethics have been derived from the concrete psychical and social sciences; economics, for example, from concrete political economy.

It will be observed that the names of all the concrete sciences end in y , and those of all the abstract sciences in cs . This is neither a result of conscious agreement nor a mere accident. It is a consequence of those subtle associations of ideas that so often influence us without our being aware of the process at the time. Another curious fact, to which Professor Hadley has called my attention, is that we have in names no longer used, or disappearing, a record of the transition stage in which the differentiation of the abstract sciences from the concrete was taking place. Thus physics was natural philosophy; biology was natural history; economics was political economy; ethics was moral philosophy.

If the foregoing scheme of classification is scientifically valid, I have been entirely right and self-consistent in claiming that the theories of pure economics presuppose some portions of descriptive sociology, while the explanatory portions of sociology assume and appeal to the theories of pure economics. Referring to the figure, the reader will observe a section of the field of sociology $s' v' w' u'$ which is also a portion of the field of pure economics. From the concrete studies of this section have been derived our abstract economic theories. Such theories being formulated, we can go on to the profitable study of a further section of the sociological field, namely, the ethical, $u' w' w u$.

The second question upon which Dr. Patten and I have disagreed is whether a consciousness of marginal utility is created by social

relations or is antecedent to any social relation whatsoever, even the earliest or simplest.

My comments on the further contributions that Dr. Patten has made to the discussion of this question must be brief, but I do not want to leave the subject without putting on record my dissent from his assumptions and conclusions. The whole issue turns on the meaning of the words "social" and "association." Dr. Patten is mistaken in thinking that I would call the hostile contact of a beast and its prey "association," or regard creatures of different species as parts of one society, or group such phenomena together with the bonds that unite the mother to her child; and it is this misapprehension which leads him to say that my thought would give to the words "social" and "association" "a new meaning opposed to all usage," and so "confuse two concepts which must be kept distinct."

I have never thought or spoken of mere physical contact, hostile or friendly, as constituting association or a society. It is association *if and only if accompanied by a consciousness on the part of each of the creatures implicated that the creatures with which it comes in contact are like itself*. This consciousness of kind is the elementary, the generic social fact; it is sympathy, fellow feeling in the literal as distinguished from the popular sense of the word. When this consciousness exists imitation follows necessarily (as I shall show further on) as a mere matter of feeling, or even of reflex action, and long before it is accompanied by reflection. I claim then that the contact or grouping of creatures of the same kind, *e. g.*, amœbæ with amœbæ, bees with bees, blackbirds with blackbirds, prairie dogs with prairie dogs, horses with horses, and so on, when accompanied by a consciousness of their identity in kind, and by imitative actions, constitutes "association" and the beginnings of society. Does Dr. Patten admit this claim or does he deny it? I wish that he had told us just what he means by a "social instinct." I believe that all social instincts, social feelings of every description, have their beginnings in the feeling of identity of kind in creatures of the same species.

If Dr. Patten admits this the further question is, Does the feeling of identity of kind precede, and through helpful imitation make possible, "an intense consciousness of initial utility," and a discrimination of initial from marginal utility? I think that it does, and I do not see that Dr. Patten has shown that it does not, or that he has answered the question that I put to him in my communication of November.

It will be remembered that in his criticism of my "Theory of Sociology" he argued that for a long period in the evolution of animal life "an intense consciousness of initial utility" makes society impossible, and that only when an animal has learned that marginal

utility is less than initial utility, will it allow a fellow animal to share a food supply which is ample for both, and so enter into social relations. In reply I asked how it comes to pass that in the absence of association, an isolated individual, which is "too intensely conscious of initial utility to perceive any lesser degrees, presently becomes aware of marginal utility and concludes to be sociable?" This question Dr. Patten has not answered. He has substituted for it one as different as possible, as follows: "But, it is asked, how do these hostile individuals, conscious only of their own wants and of the differences in the quality of goods, become aware of the presence of other conscious beings and conclude to become social?"

Dr. Patten's answer to this substituted question of his own asking is that strong animals drive the weak into poor environments, where they "must resort to new means 'to secure food or perish.' They find this means in co-operation, and thus new relations grow up between them that are absent from the stronger animals which occupy the better localities where individual exertion can secure the needed food. Social bonds at first arise not among the victors, but among the vanquished. They are the means by which the vanquished outwit their conquerors."

All this may be perfectly true. The process described has doubtless been repeated, not thousands but millions of times in the evolution of life. But, according to Dr. Patten's former argument, the vanquished are not social when they are driven out of the good environment. They cannot be social, he has told us, until they learn the difference between initial and marginal utility. Until then they must fight among themselves. I therefore repeat my former question: How do these unfortunate creatures acquire that knowledge of the difference between initial and marginal utility which, according to Dr. Patten, is the necessary antecedent to sociability?

Will he answer that in the mere passing from plenty to scarcity the distinction is discovered? Of course not. The difference between initial and marginal utility is less in fact, and is less easily perceived when food is scarce than when it is plenty. Will he then say that the knowledge is acquired when his vanquished creatures, in their poor environment, with its limited supply of food, learn, through repeated struggles among themselves, that while an initial portion of food is worth fighting to the death for, a marginal portion is not? That is exactly what I have described as one of the ways (though not the only way) in which the difference between initial and marginal utility is learned. Is Dr. Patten trying to disprove my conclusion by taking it as the premise of his argument against it?

The issue then narrows down to this: Is a consciously hostile conflict

for food, among creatures of like kind (a conflict so consciously carried on that it can result in the discrimination of degrees of utility) antecedent to a consciousness of identity or likeness of kind and its accompanying phenomena of imitation ; or is the recognition of kind the earlier and more elementary phenomenon ? This question goes to the very root of the subject. Upon it must divide those who hold by the doctrine of Hobbes, that rampant individualism and remorseless conflict preceded all society and all social instincts, from those who believe that the germs, at least, of fellow feeling, of social instinct, and of association, are as old, and evolutionally as primitive as the individual, and that from the first they have contributed to the psychic development of the individual.

The illustrations and examples that Dr. Patten has drawn from animal life do not seem to me to throw any light on this inquiry. They are all taken from too-advanced types, or the phenomena cited are not in point. The young cobra, for instance, may pay no more attention to the mother cobra than to a log, but no observer who has "seen snakes" of the real world, out of doors and by daylight, has ever imagined that a cobra does not, in fact, know the difference between another cobra and a log. If Dr. Patten will turn to such a work as Dr. Joseph Leidy's "Fresh Water Rhizopods of North America," and study there the structure and habits of the lowest known forms of animal life, he will find material that is more relevant to the issue.

Through the study of such material I believe I have discovered the answer to the question : How and when does the conscious recognition of a fellow-creature, as of like kind with one's self, arise ? The subject is properly one for a psychological journal, and I had intended to present it through such a medium, but this discussion would be incomplete and inconclusive without a brief statement of it. The lowest creature, a mere bit of structureless sarcodæ, without stomach, limbs, or organs of sense, has its favorite foods and makes curious selections. It draws into itself a diatom shell containing a living diatom, but knows and refuses an empty shell. It appropriates not only diatoms, desmids, and other forms of vegetable food, but also such animal forms as rotifers, but it does not devour its fellow amœbæ. It shows in many ways that it knows the difference between fellow amœbæ and other objects. How, then, does this knowledge arise ?

The explanation, I think, is extremely simple. Conflict does not enter into it. The amœba projects its body substance in pseudopodia, thrust out in many directions, and, in so doing, assumes endless varieties of form. The pseudopodia grasp and draw in food objects.

Frequently they come in contact with each other. Instantly a double feeling arises; the simultaneous feeling of touching and of being touched. The creature thus learns to associate a certain touch with itself. It knows the "feel" of external contact with its own substance. This feeling it does not associate with nutrition, because, even if one pseudopodium coalesces with another, a body cannot nourish itself by absorbing itself. Accordingly, when, at a subsequent time, it comes in contact with another amœba, and experiences feelings of touch like those experienced in touching itself, it recognizes the creature as an object like itself, and therefore as not food.

In like manner the earthworm, through doubling and coiling upon itself learns to know the "feel" of its own substance, and to know the difference between fellow creatures of its own kind and all other things; and insects, through the contact of their legs and wings, and particularly of their antennæ, acquire the same knowledge.

Therefore I conclude that the struggle for food does not take the form of a direct conflict between creatures of the same kind as early in the evolutionary process as has been supposed. The earlier, and at all times the more common and important process, is a conflict between unlike forms of life. In the earliest stages of evolution, as now in civilized human societies, the conflict between creatures of the same kind has been in the main indirect, rather than direct, a competition or rivalry rather than a set-to or battle. From the first it has been modified by the recognition of kind and the instinct to avoid one's own kind as food, an instinct which, I think, has been broken down only by starvation.

Nor are the mere recognition of kind by a sentient animal, and the instinct to refuse living creatures of its own species as food, the only consequences of repeated external contacts of one part of its body with other parts. It so learns not only to know its own substance objectively, but to know its own motions by external touch as well as by internal tension. Through the mediation of this knowledge it recognizes as like its own the motions of creatures like itself. Their motions, therefore, become stimulations that set up like tensions in itself and start like motions. This is the beginning, as it is the essence, of imitation. Consequently imitation is older than conflict among creatures of the same kind.

Thus the beginnings of the social feelings and of social actions are as primitive as the beginnings of individual instincts.

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